The
Microbe-Producing-Disease Theory
Inconsistent
With the Laws of Nature

How Diseases are Produced

A New Physiological Law Promulgated

Schmitz

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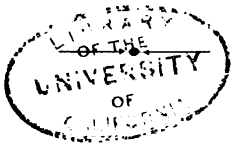
by

Prof. J. P. Schmitz, M. D.

Author of "Human Physiology, Analysis and Digest, for Medical Students and Practitioners;" "Over 3000 Questions on Laws of the Human Body;" "Key to all Questions of Human Physiology for State Medical Examiners, and Professors on Physiology in Medical Colleges;" and "Cause of Diphtheria and the difference between Diphtheria and Croup."



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THE MICROBE-PRODUCING-DISEASE THEORY PROPERLY INVOLVES ELEVEN QUESTIONS:

1. What is a microbe?
2. Are microbes in the human body in health?
3. If microbes are in the human body, do they cause disease?
4. Do microbes consume material in the human body which the economy requires?
5. Do microbes attack healthy tissues, or change normal healthy matter in the human body into injurious matter?
6. Are microbes simply on account of their presence injurious to the human body?
7. Does abnormal or decomposed matter contain the poison injurious to the human body, without the microbes?
8. Do microbes act as foreign poisonous matter in the human body and thereby cause disease?
9. Can any disease be cured by simply killing the microbes?
10. Why do microbes exist?
11. How are diseases produced?

I. In order to avoid repetition and for the sake of shortness, the word Microbe shall include all that are at present considered as microbial vital beings, such as those that can only be seen under the microscope, for instance, Schizomycetes, Schizophyta, Microphytes, Micrococci, Bacilli, Spirilli, Bacteria, Leptothrix, Vibriones, Staphylococci, Clostridium, Beggiatoa, Spiromonas, Spirochaete, Cladothrix, and all those that have received no name as yet, as well as those that are too small to be seen under the most powerful microscope. If one of these names actually includes any other, or if one is a derivation from another, matters not; the question 1st is: **What is a microbe?** Of course, the bacteriologist may say: A microbe is a minute vital organism which can be seen only under the microscope. But, such a definition is, to say the least, not very precise and not a little evasive; for, one having a microscope of a power say 250 can claim that he sees microbes. Another who has a microscope of a power of 1000 can see other microbes. Another still with a power yet higher might claim to see more and other microbes. Where then is the limit to our observation and who can assign it? That there are creatures beyond the range or power of any of our optical contrivances to detect, is, I might say, certain; just as certain as that there are stars in the heavens beyond the range of our most powerful telescopes. Shall we then leave these creatures un-named, or shall we not classify them all under the one head "microbes?" The latter course would seem to be most rational and at the same time most general and comprehensive. We shall therefore follow it and consequently define microbes as: **The minutest forms of life, embracing both what is revealed to us by the microscope and what lies beyond the power of our most powerful optical instruments to detect.** Now, should this definition seem extravagant or strange, for after all are there not things which really exist and yet will either never be detected by the senses or cannot?

The *Ether* of the universe, on account of its extreme tenuity is undetectable by any process at present known to science. It does not enter into combination with other substances; therefore, its quantity, quality and action always remain constant. Assuming the atomic theory to be the correct one, ether forms the interstitial medium between the atoms and molecules of all gases, fluids, and solids; entering the inter-atomic and molecular spaces on the expansion of these bodies and receding on their contraction.—Here then we have a medium capable of entering the inter-atomic and

molecular spaces of matter at the center or bowels of the earth as easily as at the surface. More than this, what do we know about ether, and yet that it exists is beyond the shadow of a doubt.

Now, in regard to the *Atom*. Who has seen it, who has handled it, yet, modern science declares its existence with the utmost certainty. Maxwell tells us that "a mass weight of one gramme of hydrogen atoms numbered about 216,000 million millions; their mean velocity about 6,100 feet per second; their collisions about 17,750 million per second; and the average path without collision, about 38 ten-millionths of an inch. To count the number of atoms in a pin's head, at the rate of ten million in a second, would require 250,000 years." Now whether what he asserts be true or not, matters little. I quote his words simply to show that much in modern science is admitted, the objectivity of which is by no means certain. Of course I do not pretend to say with that certainty with which one admits, for instance, the existence of the ether, that there are forms of life beyond the power of our most powerful microscopes to perceive; yet I do claim with at least as much certainty as Atomists admit atoms, that there are such forms of life.

I stated on page 23 of my Text-Book on Physiology, Analysis and Digest, for Students and Practitioners: "An *Organism* consists of a combination of organs, and has specific functions. In structure it is capable of performing actions and producing effects not only by itself and within itself, but also on matter external to and outside of itself. An *Organ* is a part of an organism, and its action is its function."

Accordingly, to be an organism, a thing has to have organs. A thing that has not two or more organs, can surely be no organism. Also, to be an organ, a thing must be a part of an organism. Everything derived from a thing that once had organs, we call organic, for instance, cloth (from wool of sheep), or a piece of wood (the wood was once a part of a living tree), etc. In the animal and vegetable organism, a cell is an organ, because it performs natural functions in, and is a part of the organism. Now the question arises: Is the vital living microbe an organism? We answer yes without any hesitation; for, it is impossible in the present order of things for any material form of life to exist, 1st, without assimilation of extraneous matter to its own being, and 2d, without the ejection of matter not necessary to its well being, in order to keep it within the corporal limits determined by its nature, both of which powers require organs.

II. **Are microbes in the human body in health?** In answering this question I have to refer again to my physiology, page 23: "Organic bodies differ from inorganic by the introduction, assimilation, combination, and reconstruction of new or fresh matter. Certain inorganic substances aggregate to themselves fresh material, enlarging in size and quantity, thus showing a quasi-assimilation; but they do so only by the addition of particles of matter to their exterior. The organic living structure grows by the addition of new matter not only to its surface, but throughout its entire mass; (now comes the point) and at the same time it continually changes, **decay and repair going hand in hand.**" Here we notice that the natural law of organisms is "decay and repair going hand in hand." Consequently, decay is natural in the organism, and where there is organic decay, there must be microbes, and this we shall better understand further on. For the present we must be content with the answer: Microbes are in the most healthy organic body.

III. **If microbes are in the human body, do they cause disease?** Of course, the microbe-maniac can see no other cause for disease than Microbes; just as the Vermiform-appendix-maniac can see no function for the appendix, and nothing else in an abdominal pain but appendicitis. The microbe-producing-disease theorists claim so much for the "effect" of the microbes, and yet no one has shown the "why" and the "reason" for the "cause." In each and every disease in which it is claimed that microbes are found and that the disease was caused by them, it can be proved, on physiological grounds, that the microbes did not produce it. Although this is not the place to fully treat the question, yet sufficient reasons will be adduced to show that microbes are not the "cause," and in fact wherever animal or vegetable matter exists dead or alive, there must be microbes. This is a law of nature as well as any other, and yet this law has never so far as I know been recognized or even surmised. I intend then to prove that such a law exists in nature.

Infectious diseases are more numerous than other diseases, and, if microbes cause the disease, by what or how do they injure the body? How or by what do they produce the anatomical changes? Why do some patients die and others not? Why are some persons immune against certain diseases and others not? At any rate, in what does the immunity consist? These questions have not been explained or answered, yet the bacteriologist claims that microbes produce diseases.

If microbes were the cause of disease, how is it that catarrh, measles, scarlatina, variola, typhoid fever, and many other diseases, each has its particular course and termination? Does this not show that the microbes have nothing to do with it?

In analyzing the microbe theory, we find that microbes have no function or power to produce any disease whatever in a healthy organism. Soon after the death of a tissue or a body, the microbes commence the separation and isolation of the anatomical and chemical elements, thereby fitting these elements again for living organisms. *That is their duty and function.* The microbe is not a disease producer. It takes hold of that matter only which is decayed or dead, and transforms that matter into its primitive elements, whereby, it becomes useful again for assimilation and growth of new animal and vegetable vital tissues, as will be seen in part 10.

IV. **Do microbes consume materials in the human body which the economy requires?** No one can show or prove that microbes use or live on healthy vital tissue, and neither can any one show or prove that the microbes produce the poison or decomposed matter that causes disease.

The laws of nature allow absolutely nothing useless in nature; the difficulty lies only in our comprehension of the facts concerning these laws. All sciences, if they be true, must be founded on the laws of nature, and any science not founded on them, is fallacious and must eventually fall. In what follows I intend to prove that a law exists whereby the organized animal and plant depends on microbes, and that microbes depend not on the vital tissues of animal or plant, but on decomposed or dead matter; in a word, I intend to show that microbes do not consume the materials in the human body which the economy requires.

Now, if we show that a natural law exists whereby the microbes must be present wherever organic decomposed matter exists, then it will become clear that the presence of microbes cannot mechanically or otherwise injure the body, because that would work against their law. Such contradiction exists nowhere in all the laws of nature.

V. **Do microbes attack healthy tissues, or change normal healthy matter in the human body into injurious matter?** Bacteriologists have discovered microbes in almost every disease known, and yet, the microbes found disappear as soon as the vital forces of life are re-established. This alone ought to be a sufficient proof to every man of common sense,

that microbes do not attack healthy tissues, or change normal healthy matter in the human body; consequently, microbes cannot produce disease.

VI. **Are microbes simply on account of their presence injurious to the human body?** Since the law for microbes and their functions is that they should be present wherever there is decomposed organic matter, as we have seen in question IV, therefore, it is the decomposed matter in the body that lies at the seat of the trouble; that is, the abnormal amount and quality of such matter. If that matter was not present, then there would be no microbes present; consequently, the simple presence of the microbes is not injurious to the human body.

VII. **Does abnormal or decomposed matter contain the poison injurious to the human body, without the microbes?** Certain microbe advocates claimed in a certain case that the persons attacked with cholera had been using water from a tank where the soiled linen of two cholera patients had been washed. Who can prove that the microbes caused the disease? We claim they did not. It was the dirty, poisonous water that caused it. When the water was in such a decomposed state that microbes (other than normally present) were in it, such decomposed water had sufficient effect on the delicate mucous membrane of the intestines that abnormal microbes could live there too, because decomposed matter is their normal proper soil.

All infectious diseases depend upon the quantity and quality of the virus, or auto-toxine, not on microbes. Microbes cannot grow without a suitable soil; consequently, the suitable soil is the first requisite. Impoverishment or an abnormal change of the blood, lymph, or of any decomposed tissue furnish the suitable soil, and if the suitable soil is injected into a healthy individual it causes disease; and if that suitable soil is derived from a specific disease, it causes that disease.

In all febrile diseases the blood swarms with microbes, and yet, the sensible physician pays no attention to the microbes, but he cures the disease. In "cholera" they find the "coma bacillus," not in the blood, but in the intestines. Here the bacilla are the "result" of the decomposed membrane, which is their suitable soil. Statistics show that cholera appears in Europe at periods of from fifteen to eighteen years, and it is claimed that the disease is introduced by tradesmen and travelers coming from the river Euphratres in Asia. The cholera exists in the Euphratres valley every year. Now, why do those travelers and tradesmen not bring

the cholera every year to Europe? The answer must be: Because the suitable soil does not exist in Europe until every fifteen or eighteen years.

Filth is the great breeder of disease. Prevent or remove the filth in and outside of the body, and then we need not fear the microbes. When organic matter is once present in the body in an abnormal increased quantity and in such a state that different kinds of microbes live in it, that matter is for the body a poison and is able to affect other matter in such a way that the same kind of microbes can live and multiply in it. If we remove or counteract that poisonous matter, we cure the disease that was caused by it. For illustration, if we inject, apply, or administer a sufficient strength of a certain remedy, such as strychnine, arsenic, carbolic acid, or one of many other medicines (surely without microbes), we produce an inflammation and change of tissues, in which afterwards microbes are found. If we add certain other medicine to the injection, application, or administered poisonous medicine so as to counteract the effects, no poisoning takes place, and no change of tissues, and no microbes will be found. As all antiseptics in medicinal doses (if too strong, they do more harm than good) are more or less stimulant to cells for healthy action, they must have counteracted the poisonous effect of the decayed matter. Microbes nicely washed and cleaned, and then injected, applied, or administered to a healthy person without the poisonous matter, would do no harm, except as a foreign substance possibly in certain localities, and then only like any other foreign substance would. Here again arises the question, who is able to "nicely wash and clean microbes from decayed matter?" The answer must be, that it is an impossibility, if it is true that microbes exist in size of the 500,000th part of an inch, as is asserted. The size then explains to us, too, that we can find microbes in abscesses situated in very solid tissue of the body, wherever situated. In fact, that the microbe is enabled to penetrate all fluids and tissues (like ether) between atoms and molecules, if decayed organic matter is imbedded in such solid tissue. It is the natural lawful function and duty of the microbes to be present in decayed organic matter wherever situated.

Now, the "culture soil" in which the microbes are cultivated, or propagated, may be illustrated as follows: Every house-wife knows that mutton broth or bouillon changes or decomposes according to the temperature and other conditions within a day or two. If such were injected into a delicate person it would certainly

be enough to make him sick. The bacteriologist prepares his "culture soil" with mutton-broth or bouillon, or similarly decomposable substances, by adding already decomposed blood or tissue of a specific disease. Suppose he produces the same disease in the person or animal injected, does that prove that the microbes in the decomposed "culture" produced the disease? By no means. The poison of the culture done it. In case he neutralizes that poison, he can no longer produce the disease. In every instance decay or death of tissue must precede the microbe.

As soon as investigators turn their attention to discover the proper antidote for each poisonous matter developed in the body, or for that which is liable to enter the body, they will surely prevent or cure diseases, be they infectious or not. If we treat our patients according to the natural laws of life (physiological laws), if we understand them, and if we do not understand them, we had better learn them, then we need not bother our heads about microbes. We will then succeed in curing our patients, and, if we cannot succeed, we need not have any conscientious scruples that a microbe-killer might or would have succeeded. The microbe-maniac hunts for a remedy to kill the microbes of disease; he tries to disregard the natural laws of life. He is like the maniac materialist who tries to disregard God, the Creator of all the laws of nature.

VIII. **Do microbes act as foreign poisonous matter in the human body, and thereby cause disease?** The answer must be that they do not, as we have already seen in the foregoing, because they are only found in decayed matter. Every specific disease is due to a distinct morbid substance. As in all organized bodies "decay and repair go hand in hand," the microbes must be present wherever there is organic decay; consequently, some are in the healthiest human body. In disease the kinds of microbes present depend on the kind of tissues involved. It would surely be an inconsistency in the natural law, explained in the following, if they acted as foreign poisonous matter. We know that no inconsistency in any laws of nature is possible; therefore, if the microbes produced disease, they would soon cease to exist.

Decay is natural in the organism, and when there is too much of it present in the body, there are an increased number and kind of microbes present, which kind, depends much on the kind of tissues involved. Microbes follow as a "result," but are not the "cause" of disease. It is an error to suppose that microbes are our enemies. On the contrary, they are for us. Without the mi-

crobes animal and vegetable life would become extinct on the face of the earth. They render animal and vegetable life possible. They are the indispensable intermediaries in the circulation of matter. It is surely a waste of scientific brain-energy to try to destroy the microbes in their natural elements of diseased or mortified tissues.

IX. **Can any disease be cured by killing the microbes simply?** We have already found that the microbes are not the "cause" of disease; consequently, by killing the microbes simply, we can never cure a disease. It is not true that microbes (bacilli) produce Small-pox, Diphtheria, Typhoid fever, or any other fever, or that Consumption is caused by the tubercle bacillus, or that Mosquitos carry only the germs from the sick to other persons and thereby inoculate them, or that comma bacilli produce Cholera.

In analyzing the thirty years war going on in regard to the production of disease by microbes, we find that it is like the "Kaiser's Bart" (Emperor's beard). It is said that at the time the Germans were thinking of the advent of their first Kaiser (Emperor), they got into a terrible fight among themselves. Some claimed that the Kaiser must have a red beard; others that he must have a black one, others a gray, and so on. After the fighting was over, and they had their Kaiser, it was found he had no beard at all.

The finding and proof of the existence of bacilli has not in the least advanced our knowledge of the disease or given us any advantage in regard to diagnosis, prognosis, or treatment. The bacteriologist can never succeed in explaining the cause of any disease, because the microbe theory is against the law of nature. The scientifically educated and common-sense physician adheres to *cellular pathology*. He is, therefore, always right anatomically, physiologically, and chemically. The ancient physicians were ignorant of anatomy and physiology, and for that reason committed many blunders. The ignoramus of to-day goes on in the ancient ideas, and introduces untruths into the medical college, in place of anatomy and physiology. Doctors, ignorant of anatomy and physiology, fill our graveyards with premature deaths and do not know it. The old time theory held that diseases were of the blood, and the lancet was used. The treatment of the microbe theory is worse than the lancet was, as the latter weakened only by removing a part of the nutritious blood of the body; but the microbe-killing remedy introduces ten devils into the body where before there was

only one. Of course it can be only those who administer microbe-killing remedies who are unable to make the proper diagnosis. Such resort to the microscope, and there they get stuck again, because in every disease there is more than one kind of microbe.

The microbe theory cannot stand, because it is repeatedly proven by experience that patients with unquestionable bacillary development in their bodies have and do recover from all symptoms of the bacillary disease and become healthy without a microbe-killing remedy. The active practitioner has been very slightly affected by the microbe theory, and their authors. It is indeed too bad that young practitioners allow themselves to be influenced by the teachings of men who dream day and night of microbes. A practitioner of good practical common sense knows that a remedy administered with the intention of killing the microbes cannot succeed. The ignoramus kills his patient and he does not even know it. He attributes it all to the cause and action of the microbes.

The following remedies, it is claimed, will kill microbes: Nitric acid, hydrochloric acid, sulphuric acid, boracic acid, iodine, bromine, chlorine, copper sulphate, zinc sulphate, corrosive sublimate, benzoic acid, thymol, eucalyptol, many of the aromatic oils, alcohol, and many others. Now, of what use and benefit is it to the physician to know of all these so-called remedies when not a single one of them can be used strong enough in the human body to kill the microbes? In almost every instance there are two, three or more different kinds of microbes present in one disease, and each kind would require a different remedy to exterminate it.

In what way has the knowledge of bacteriology helped the physician for more than thirty years in regard to infectious diseases? Has it or can it help in diagnosis? Positively no; because there is generally more than one kind of microbe present. The physician who is not able to make a diagnosis on anatomical and physiological grounds, and has to hunt for microbes, is not fit to practice medicine for the want of a sufficient knowledge of the laws of life. Again, according to the state of the disease and decayed matter present, the kind of microbes differ. It has often been shown that one kind of microbe exists, and, as the decomposition of the different tissues advances, other kinds of microbes make their appearance, the first kind either remaining or disappearing.

The bacteriologist tries to build up a bacteria pathology; but in this he can never succeed, as it is against a law of nature. This law is, that all decayed organic matter is the natural soil of bacteria, as we have already said. Again, the bacteriologist tries to do

away with *cell pathology*. In this he can never succeed either, because cellular pathology is within and built on the laws of nature, and must forever remain at the foundation of medical treatment. The cells are the performers of the work in the organic body, and no one can show that bacilli attack healthy cells. We have already proved that microbes do not and cannot attack healthy vital tissues, because that would be against their nature, which is to thrive and live on decayed organic matter.

Any one who has tried to kill the microbes in decayed organic matter must have found how difficult it is even with the most thorough and approved methods. He knows that they are dispersed throughout the body; consequently, any one endowed with common sense must have come to the conclusion that, to build up a bacteria pathology, is and remains forever an impossibility.

It is difficult to understand how a physician can use a remedy through the mouth, or by inhalation, in order to pass it into a cavity of the lungs, or that the remedy should hunt throughout the vascular system, or among the membranes, so as to take up the battle with the microbes and succeed in killing them. It seems impossible that sensible men could have such ideas. Antiseptics administered internally strong enough to kill microbes injure the cells and tissues more than they do the microbes; therefore such treatment can never succeed. The success of Lister's treatment in surgery is not due to the antiseptic as a microbe-killer, but simply to the antiseptic as a stimulant to the cells and to cleanliness.

No one can have any objection if a bacteriologist has a fancy or liking to study histology and investigate tissues with the microscope, as long as he keeps quiet in regard to organic activity and vital functions. The mixing up of physiology with histology will never do, because to study the organic activities and vital functions with the microscope is as foolish an act as it would be to study the laws of the land with a microscope. It is remarkable that even the advocates for State medical examinations are at times affected with the microbe mania. State medical examinations are all right, but that in some States the law includes examination on bacteriology in regard to microbe-producing-disease is, to say the least, nonsense; because, in the first place, the examiner himself does not know what a microbe is, what its functions are, and for what reason it exists; second, it does not advance medical science a particle.

The germ theory can never prove that original contagious diseases, such as Alopecia, Aphtha, Chancre, Cholera, Conjunctivitis, Diphtheria, Erysipelas, Eruptive Fevers, such as Measles, Scarlatina,

Smallpox, etc., or the Puerperal Fever, Typhoid, Typhus, Yellow, or any other fever, or Gangrene, Gonorrhœa, Hydrophobia, Influenza, Lepra, Lupus, Meningitis, Mumps, Ozæna, Phthisis, Plague, Pyæmia, Septicæmia, Syphilis, Tetanus, Whooping-Cough, or any other disease, are caused by microbes.

X. **Why do microbes exist?** We have already said that it is natural in vital organisms that "decay and repair go hand in hand," and, for a better understanding of this, I will quote a little more from my Analysis and Digest. On page 248 it is stated: "The changes in the vital economy (animal and vegetable) termed *metabolism*—going on under the influence of the activity of the vital principle (soul), guiding the chemical combinations within the vital animal and vegetable economy—are properly divided into two kinds: One, termed *anabolism*, implies an upward series of chemical (elementary) combinations, by which the latent energies of inert food are transformed into the living energy of the protoplasm of the bodily tissues. The other is termed *katabolism*, and involves a downward series of changes in the vital economy by which the living tissues are partly broken up and the waste matter is set free." Here we notice again that in the most perfect healthy organism (animal and vegetable) "waste matter is set free." This waste matter is organic, because it is derived from an organism. If all the waste and decayed matter from animal and vegetable sources existed since the Creation, I am sure that all of us would feel like emigrating from this planet. As the Creator wished it otherwise, He therefore created the microbes in order that all waste matter might be of use again for animal and vegetable organisms. The co-operation of the microbes is indispensable for the continuance of animal and vegetable life. Matter that once formed a part of a vital organism, but is now dead, is by the microbes reduced to its elementary state, thereby fitting such elements again to be used by vital living organisms. This proves that the vital animal and vegetable organism depend on the microbes for the principal natural nutritious elements. On the other hand, it also proves that the microbes depend for their natural existence and functions on decayed animal and vegetable organic matter.

The chemist may say: The breaking up of decayed animal and vegetable matter and the isolation of their elements belongs to chemism. We intend to prove that a natural law must exist in regard to decayed organic matter and microbic functions, as stated above, and that the isolation of decayed organic matter is not chemical action. From a likeness of effect we argue a likeness of

cause. Now, modern chemistry does not recognize a vital cause or a vital effect. It has never shown us the atom, the ether, the vital part of the animal and its functions, the vital part of the vegetable and its functions, the vital part of the microbe and its functions. It is a physiological (natural) law that the vital animal body is considerably dependent upon the vital vegetable for the element oxygen given off by bark and leaves. It is also a physiological law that the vital vegetable structure is principally dependent on the vital animal for the element carbon given off by the lungs and skin.

Here, then, it is not out of place to **lay down and proclaim** that a physiological (natural) law must exist in regard to the isolation of decayed organic matter by microbes, and, according to that law: **The vital animal and vegetable body depends on the vital microbes to furnish the natural elements for nutrition from matter that once was vital.** This non-living chemical action could never accomplish. On the other hand: **The microbes depend on animal and vegetable decay;** and, as soon as the animal and vegetable life is exhausted, there can be no more death. When there is no more animal and vegetable death, the microbes must disappear also; and, until that time, the microbes must continue to exist. In other words, at the end of the world only will all organic natural life disappear, and then, too, vital microbic life as a consequence.

Here, again, I must quote a sentence from my physiology, page 23: "The Organic World includes both animal and vegetable life, with their component and physical properties, chemical elementary composition, and vital phenomena. Animal as well as vegetable life depends upon the action of its individual organs—distinct, but mutually combined and dependent." Hence, we see that the organic world is endued with life, and that all organic life depends upon the action of its individual organs. Now, the microbe has life, but what the action of its organs is we do not understand. Nevertheless, we know that the part the microbe plays in the economy of nature is to separate and isolate non-living organic matter, fitting it for assimilation to other organic beings. I know this strikes at the foundation of organic chemistry, but I cannot help it. Science seeks truth, and nothing else. It also shakes the bottom out of the microbe-producing-disease theory, and confirms the already existing law, **that the microbes naturally depend on the animal and vegetable, and these in their turn on the microbes.**

Science recognizes about 400,000 kinds (classes) of animals, while it knows only about 150,000 kinds of plants. The insect world comprehends about 280,000 kinds, of which 120,000 are Beetles, 50,000 Butterflies. There are about 38,000 skin-wing flyers, 13,000 kinds of Birds, 12,000 kinds of Fishes, 8,300 kinds of Reptiles, of which 1,640 are Snakes (about 300 poisonous). In addition about 1,300 Amphibies are known, 20,000 kinds of Spiders, 50,000 kinds of Mollusks, and 8,000 species of Worms.

Now, how many kinds of microbes are there? It is not unreasonable to suppose that there are as many kinds as there are *tissues* of organic vital beings, for, as these must die, each tissue very probably furnishes the natural soil for some particular kind of microbe.

To repeat the whole once more, I say that, among the laws laid down by God for all nature, one is, that vital organisms are enabled to organize and accumulate to a limited extent; and another law that "decay and repair go hand in hand." A man may reach the age of 150 years, the oak tree 4,000 years, yet it is only a question of time when all must decay, and the final work is accomplished by the vital microbe. If it were not for the microbes, who isolate the elements of decayed organisms, all animal and plant life long ago would have come to an end for want of nourishment. Here we notice that the law of the cycle of organic life is a beautiful one; that is, the dependence of the animal and plant on the microbes; on the other hand, the dependence of the microbes on animals and plants. *This law, strange to say, has never been noticed, so far as I am aware.*

XI. **How are diseases produced?** Since bacteriology and the microbe-producing-discase theory got into fashion, the "poor litttle cells" of the body are forgotten; yet the cells are still there and do the work. One may object and say that the cells do the work in health, not in disease. That is true. But what prevents the cells from doing their work? We have already shown that it is not the microbes, but the injured and decayed matter.

Physiology is the science of the laws of life and functions of living organisms. That this definition is true, no one can doubt; and, consequently, any one who wishes to comprehend and understand material life must first of all thoroughly comprehend and understand the "laws" that govern material life.

Microbes play a double role in nature—they complete death to prepare for the living. Without the microbes, nutritious elements for living organisms would long ago have been exhausted.

Bacteriologists for the last thirty years, have scared the people, and they have become more careful in regard to cleanliness. So far, this is all right; but has any one of the medical profession by microbe-killing (this point must not be forgotten) been able to lessen Consumption, Typhoid Fever, the Plague, Cholera, Lockjaw, Smallpox, Whooping-Cough, Pneumonia, Scarlatina, Measles, Diptheria, or any other disease? No; not one has succeeded and never can succeed, because it is against a law of nature. The claim of some in curing disease or healing wounds by the killing of microbes, is nothing but antidoting the diseased matter, whence the cells are enabled to perform their normal functions. The error of such lies in a misconception. Does not every physician who treats his patients according to the laws of life always succeed best? Does not every such physician feel in his heart a disgust for the notoriety hunters of the microbe-producing-disease theory?

All thoroughly educated physicians in anatomy, physiology, and medicine positively know that the "*cells*" do the work in organisms; and, consequently, only the ignorant throw aside "*cell pathology*" and try to substitute a "microbe pathology" in its place. The proof of the existence of the so-called bacilli has not explained a single disease; neither has it brought out any advance in diagnosis, prognosis, or treatment. We know the vital reaction of the cells and distinguish between the effects caused by decayed or poisonous matter—for instance, *ptomaines*, the principal acting substance in decayed or putrified animal or vegetable tissue. The ptomaine is to dead tissue or matter what the albuminoid (proteid) is to living matter. And here it may be remarked that it must not be imagined that everything that stinks is a poison. To prevent dirt, and filth, and keep things in a good sanitary condition should be done not with a view of destroying microbes, but of preventing decomposed poisonous matter and thereby the ptomaines. To try to kill or prevent microbes in decomposed matter is to work for no purpose, because it is opposed to a law of nature.

The germ theorist holds that the "exhaled" floating particles are the bearers of germs of specific infectious disease. Why not the poisonous floating particles themselves, without the microbes? Are such filth particles (disease is filth) not poisonous and irritating without the microbes? Does not a certain strength of inhalation of ammonia, or other medicines, produce disease without the microbes? Does not a cold in one part of the body cause contraction of the muscular fibres and thereby contraction of the capillary vessels? According to the severity of the cold and according to the

condition of the blood, the lymph and tissues of the contracted part degenerate, cause disease, and, in fact, a different kind of disease in each individual, according to the place affected and the state of the system at the time. An abnormality of microbes in the body are a "result," not the "cause," of any disease. Tie a string around your healthy finger and in less than a week your finger is in a state of mortification and full of microbes. Are the microbes present the cause of the mortification of the finger? No; the cause was the string that cut off nutrition to the finger. The theory that epidemic diseases are dependent for their causation upon the presence of micro-organisms is not founded on truth. Climatic effects on air, water, and other matter affecting a predisposition in the animal, or human body, is the cause, not the microbes.

All animals and vegetables—that is, organisms—take on (assimilate), transform, and accumulate matter; at the same time these organisms transform, reduce and give off matter. Yet it is only a part of that healthy organized matter which is transformed, reduced, and disorganized in the body, and the destructive work of that decayed matter is not completed. In order that decayed matter, in and outside of the body, be completely broken up, so as to reduce it to a state suitable again for assimilation in the animal and vegetable, the co-operation of the microbe is indispensable.

On page 24 of my physiology I stated that: "About fifteen of the elements known to chemists take part in making up the tissues of the human body, the majority being present in small and varying quantities only. Four elements, however—hydrogen, oxygen, nitrogen, and carbon—occur always in large quantities, constituting 97 per cent of the animal frame—hydrogen, oxygen, and carbon being the most constant and abundant." Again, we must not forget that an element is and remains an element. No chemist or chemical action can make one, nor can it destroy one. The difference or importance lies in the compounds of elements in regard to organisms. If a compound of elements also contains a vital principle (soul), that compound is a vital being; if a compound contains no vital principle, or if that vital principle has left the compound, as it does in the human body; or if the vital principal ceases to be in the compound as it does in the animal or vegetable, that compound is dead; yet the elements remain after as before. The microbes do not destroy a part or the whole of a vital organism (because it is not their office or function) as long as every part of that oganism is in a normal healthy vital condition; but as soon as any

part of that organism becomes abnormal—that is, dead tissue—then the microbes are at hand, because that is their "proper soil" for action; and possibly each *bacillus* takes along a *bacilla*, and in less than no time millions are at work to do their normal duty according to law; that is, to complete the disorganization of the dead organic matter and isolate the elements for the use again of vital organisms. If, however, the proper antidote is applied or administered to the poisonous dead matter in the vital organism, so that the cells can go on repairing the broken-down tissue, then the microbes cease their work.

Some one may say: "This is all very nice talk or reading, but where do the microbes come from when they enter the decayed matter of the body?" To answer this I must state that all physiological questions require thought. If one has followed this dissertation with sufficient attention, he will already have found that all organic matter must contain microbes, and our food and drinks are principally organic matter.

According to the Medical age, "Bouchard injected cholera matter filtered, into rabbits. These animals had cramps from within two to five minutes after the injection, lasting half an hour. Then they had diarrhœa within a few hours, which consisted almost entirely of desquamated intestinal epithelium; it was a veritable choleraic flux of pea-soup consistence, lacking nothing but the comma bacillus. There was no bile in the intestine, it being retained in the gall-bladder. The animals were affected with slight and temporary albuminuria, becoming more and more intense till anuria set in, and all died after three or four days." Then he concludes: "Was it the cholera I had given to these hares?" He states, "No; it was only a peculiar kind of poisoning, with a certain resemblance to cholera, for there was no period of incubation, and the morbid accidents were immediate; besides, the phenomena were proportional to the doses of injection injected. With 12 c.c. and below, the animals survived; above 17 c.c., died. Consequently," he states, "we cannot doubt but that we had to do with toxæmia, or poisoning."

It is the dirt—that is, the poisonous fluid or poisonous decomposed dead tissue—that acts on the cells and prevents them from performing their proper functions. Physiology teaches us that "animal as well as vegetable life depends upon the action of its individual organs (cells are organs too), distinct, but mutually combined and dependent." As long as the cells do their normal functions, the body is healthy. It is the poisonous matter that

prevents or interferes with the cells. The poisonous matter more or less paralyzes the cells, according to the poison.

Of all diseases known to man, each has received a name. The microbe hunter seeks for the name of the disease; for instance, Phthisis, Cholera, Malaria, and the like, and then assigns the microbes as the cause. The charlatan only treats diseases by names, or according to the microbes found. The thoroughly educated physician in anatomy and physiology treats diseases by their symptoms of abnormality. To illustrate: Suppose a diseased condition brought on in the body by an over-indulgence in food; and, suppose, any kind of nervous disease, or Rheumatism, Gout, Bright's disease, Consumption, or Malaria. Is it proper to treat the disease by name and allow the original cause to remain unnoticed? Again, is it rational to hunt for the microbes now present and claim that the microbes produced the disease? The name of a disease is surely no guide for treatment; but the symptoms are, because they indicate and show us the anatomical and physiological changes which have taken place, and it may be in many organs at the same time. Without an anatomical or physiological change, there can be no disease, and, without a thorough understanding of anatomical and physiological change, there can be no scientific treatment. The blind bird may find the acorn on the road, but the chances are against it.

There is surely value in antiseptics and in disinfection—not on account of killing the microbes, but by antidoting, stimulating, or by removing the decomposed matter. We have already noticed that microbes cannot live without filth; therefore, natural purity and cleanliness in and outside of the body covers the entire prophylaxis and treatment, because then the cells and organs can perform their proper functions.

That for all decomposed poisonous matter there must be proper antidotes, there can be no doubt; therefore, if microbe hunters turned their attention to proper antidotes and to the removal of decomposed matter in and outside of the body, they would succeed in curing, as it is consonant with the laws of nature. Simply killing the microbes makes matters worse.

Many physicians and surgeons entertain a favorable opinion of the microbe doctrine derived from "Lister's antiseptic" surgery; but, has the surgeon succeeded because he killed the microbes? Whenever a physician or surgeon treated a patient by injecting or applying an antiseptic with the idea of killing the microbes, and succeeded in the cure, we say, his action was right, but his idea was

wrong. Why? Are not all antiseptics more or less stimulant to cells and tissues? He cured, not by killing the microbes, but by stimulating the cells to normal action. The physician or surgeon who just strikes the proper strength of his stimulant (call it antiseptic, tonic, or anything else), so as to invigorate already decaying or weakened cells to proper normal action, will have the best success in the treatment of diseases and wounds. All this indicates that, as soon as the ptomaine (the principal active alkaloid of decomposed matter) is eliminated, the disease terminates; just as a poisonous dose of strychnine, or opium, if properly eliminated, terminates without killing the patient. We have antidotes for nearly all poisonous medicines, so that it is not always necessary to eliminate all of a poison taken.

In all decomposed organic matter (tissues) microbes can be found, but they are present abnormally only as a "result," not as the "cause." Again, that Mosquitos, Flies, and other insects can carry disease from one person to another, there can be no doubt; but it is the matter that infects, not the microbes. That the decomposed matter sucked up by the insect does not poison it, seems again to make for the theory I am here advocating, for, this immunity in the insect cannot rationally be explained on any other ground than that the insect is furnished with some fluid or other substance which prevents attack and renders its body proof against the poisonous matter absorbed from without. Of course the bacteriologist will claim that the fluid or substance found in the insect for its preservation acts by killing the microbes of the poisonous matter, but that this is not so must be rendered evident to all who have followed me in the course of this treatise.

The microbe theory can never furnish a rational or practical basis for practical treatment, neither can it help in diagnosis, as we have said before, because many kinds of microbes must be present in all diseases if extended to many different kinds of tissues. The ignorant hunt for the "name" of the disease and for "microbes," but we have already noticed that such a proceeding indicates ignorance in anatomy and physiology, or lack of common sense.

Microbes placed in distilled water die and are disssolved; even the Antrax and the Plague microbes die in distilled water. The long continued use of distilled water only as a drink kills the animal, because it deprives the mucous membranes of the necessary salts; absorption becomes impossible, assimilation stops, and the animal dies. Animals whose food and air are sterilized soon loose the function of assimilation. This again shows the part the

microbes must play in the animal economy. Their presence is absolutely necessary in the healthiest animal bodies, as we have shown in the course of this dissertation.

The nutritive substances enter the blood-circulation, and the cells of the secreting follicles, glands, and of certain tissues (for instance, the cells of muscular fibres), secrete from the blood the many different active principles—the "Albuminoids" (proteids) of the fluids and solids, such as Casein, Ptyalin, Pepsin, Pancreatin, Mucosin, Myosin, Melanin, Collagen, Chondrin, Elasticin, and Keratin. Now, an unnecessary amount, or insufficiency of elements by food, drink, or from decomposed matter from without introduced into the body make it impossible for the secretions to remain normal; consequently, a disease is developed, depending on the quantity and quality of decayed matter present. An insufficiency of elements present causes derangement too, though this (starvation) is more rare.

Normal matter changed within our body on account of a superabundance of certain elements present, or on account of some faulty function of certain cells or organs, thereby causing an abnormal condition (decomposition) of certain fluids or tissues, produces naturally an **Auto-toxine** (some may call it Auto-intoxication), that is, a poisonous condition developed within the body. According to the auto-toxine involved, any kind of an infectious disease may develop. Can a bacteriologist show that microbes are necessary in order to produce such a disease? Again, if decomposed matter is introduced that accomplishes the same result in the body as an auto-toxine, is it not capable of causing the same infectious disease without microbes? Is not an auto-toxine, or decomposed matter introduced from without, capable also of causing a predisposition for an infectious disease?

The degree of liability of the body to develop an auto-toxine depends much on the kinds of foods and drinks taken and on the natural or unnatural "decay and repair" going on in the body. If the decay surpasses the amount of repair, a disease is the result. Again, it is a law of physics that cold contracts a substance, and heat dilates; consequently, cold (according to that law) contracts the tissues of the body. Now, an auto-toxine must surely develop after a cold in any part of the body, if that cold sufficiently penetrated so as to contract the muscular fibres, which in turn press on the capillary vessels. The blood and lymph of that part is stagnated and soon decomposes, and we have the auto-toxine and a poisonous ptomaine developed. The disease after-

wards developing depends on the amount and kind of tissues decomposed and the amount and kind of ptomaine developed. That each and every kind of disease may develop from a cold I have often illustrated and satisfactorily proven to the students of my physiological class in the College.

That the different climates, habits, nutrition, etc., of the many different races of mankind can, and in fact must, produce in the one or the other an aggravation of one and the same disease, or even an entirely different disease, is nothing but natural. Again, it is not difficult to understand that a house on fire can easily set a predisposed neighboring house on fire; or that the "cause" of the one is likewise the "cause" correspondent of the other. Diseases that eliminate their poisons through the skin, as, for instance, Smallpox, Scarlatina, etc., are more liable to affect another person than a disease that eliminates its poison through the kidneys, lungs, or intestines.

Quinine has often been held up by bacteriologists as a proof of the correctness of the microbe theory, because quinia, it is claimed, cures malaria. But does not quinia often fail to cure malaria, when in fact arsenic may cure? Often both of these fail; then a powder containing the ingredients constituting the compound cathartic pills, U. S. P., judiciously administered and a proper diet, cures. The bacterialogist may possibly answer: "The diagnosis was wrong." But this is not necessarily so, by any means.

Before analyzing quinia as a curative in malaria, I have to quote once more from my physiology, page 54: "An **albuminoid** is a nitrogenous compound, also called *proteid* (holding the first place), and is composed of C. O. N. H. and S. In elementary composition the various albuminoids are alike, but differ in the number of atoms composing each. To illustrate, one albuminoid may contain more atoms of carbon, another of nitrogen, another of hydrogen, oxygen, or sulphur, and so on. The albuminoids are the most active principles of the liquids and solids of the body. Those of the *fluids* are: Casein, Ptyalin, Pepsin, Pancreatin, Mucosin, and Myosin. Those of the *solids* are: Collagen, Chondrin, Elasticin, and Keratin. The animal solid albuminoids have some analogy to the *Alkaloids* of plants, such as quinia of cinchona bark, or strychnia of mux vomica, excepting that the latter (the alkaloids) contain no sulphur." We notice, then, that alkaloids are compounds of C. H. N. and O., and are the active principles of plants. Consequently, the *Albuminoids* and the *Alkaloids* are in elementary composition much alike, except that the albuminoid

contains the element sulphur, the alkaloid none. As explained above, the *number* of elementary atoms contained in each compound differ.

Now let us analyze quinia as a bacteriacite, and, as curative in malaria. The bacteriologist claims that, adding quinia to matter containing microbes, the microbes soon become motionless and die. This, mind you, it has done as a compound. Quinia is an alkaloid, and its compound of elements is as stated, C. H. N. and O. Who has ever administered quinia that entered the circulation and tissues as a compound and so killed the microbes in the circulation and tissues? Is not the quinia broken up, as all other compounds are into its elements before it can be absorbed and enter the circulation? Now, this being understood, we may continue our illustration.

Taurocholin and Clycocholin are two albuminoid compounds and constituents of bile. Physiologically, if these bile-salts, or compounds, are not properly present in bile, or, if not properly broken up in the intestines—that is, their elements isolated and absorbed into the circulation—the animal body becomes diseased, wastes, and dies. Again, in the case of malaria, the liver is always affected and enlarged. The spleen in case of malaria is also affected and enlarged. In the spleen the hæmoglobin of the red blood-corpuscles (an albuminoid compound) is broken up into its elements, which pass into the liver and there contribute elements for the secretion of bile-salts, which, as we have noticed, are of such great importance to the body.

In malaria, the liver and the spleen are abnormal. How then can the bile-salts (albuminoids) be normally present? If in that case we furnish the circulation with elements that are wanting in the system, that is, C. H. N. and O., which exist in quinia, naturally enough we tone up the entire system and the cells are enabled to perform their normal functions again, and all the albuminoids of the body, such as Ptyalin, Pepsin, Pancreatin, Hæmoglobin, Myosin, and others, become normal once more. As soon as the obstruction of the liver and spleen is removed, be it removed with compound cathartic pills, U. S. P., or with any other remedy, and the secreting cells receive the proper elements and are enabled to do their normal functions, quinia will be no longer required in malaria. Are these not true physilogical facts? If true facts, of what use is the microbe-producing-disease mania? That malaria is not due to microbes, can easily be proven on physiological grounds—a subject which does not belong to the present

treatise. Many years ago I read a paper on the "Cause of Malaria" before the San Francisco County Society of Physicians and Surgeons, and showed that Malaria is produced by auto-toxine, and not by microbes. I also read a paper and proved on physiological grounds that Diphtheria is primarily produced by cold, never by microbes.

About six months ago I met with an accident which proved in my own person that Tetanus was not caused by microbes, and that it was not cured with microbe killers. One day I found by chance a bottle without a label on a shelf in my laboratory. The bottle contained what I supposed (by inadvertence) to be an ounce of phosphorus, whereas in reality it was metallic sodium, and, as a part of it was not covered by the fluid in the bottle, I was anxious to cover the supposed phosphorus with water to prevent it from taking fire. As soon as I poured the water into the bottle a violent explosion followed. I received thirty-two cuts and wounds on my left hand, and four in my face. My specks saved my eyes. At first I was stunned, and after I came to I ran to the hall (my office is in the Medical College) to call for assistance, but every student and professor had already gone. I went back to my office, washed off the blood, extracted the pieces of glass from the wounds, and patched up the larger cuts as well as I could with sticking plaster. The hand turned blue, and from the concussion and shock sensation entirely ceased as far as the wrist. In about half an hour the hand turned to its natural color again and sensation returned. It was, however, as if there were millions of pins in the hand, and so severe was the pain and heat that I had to hold my hand under the faucet of cold water for some time.

Three days afterward the smaller cuts had already healed, but in a large one I extracted another piece of glass about the size of a silver five-cent piece. On the fourth day I was awakened about 4 o'clock in the morning by slight twitchings in the reflex centres of the spinal cord. The twitchings became gradually more and more severe, mostly at the lower cervical and upper dorsal regions of the spine; the muscles on the sides of my neck and lower parts of the cheeks became more and more stiff and painful. I called my family and told them that I feared tetanus and lock-jaw. I ordered them to prepare quickly a kettle of hot water, and then to take a piece of flannel four or five times folded and about seven inches wide by about fifteen inches long and to bring the hot water into my room and keep it hot on a gas stove; to dip the flannel into the water and to ring it out as hot as they could. This

was quickly placed on the skin over the cervical, dorsal, and lumbar spine. I then laid on the flat of my back. The application was repeated every fifteen minutes, and in about three hours the muscles on my neck and cheeks commenced to be limber and the pain ceased. The twitchings in the spine came less frequently and became less severe. The applications after this were repeated only every half hour. After eight hours all pain and twitchings entirely disappeared. Now, no medicine was used, because my body was otherwise in good order.

Had I relied on bromides or other nervous sedatives, or on anti-toxines, or on bacilli killers, no doubt Loefler's Tetanic bacilli in about eight or ten days after the accident would have been very busy in the grave separating and isolating the elements of my body.

I am well aware that what I have stated in this treatise will have liltle weight with the worshipers of great names; yet, for all that, I do not hesitate to put my views forward, being persuaded that no man's mere word or opinion is entitled to any other consideration above the proof that they bear, and, that truth must finally triumph.

GLOSSARY OF WORDS AND SYMBOLS

USED IN THIS TREATISE.

Abnormal. Not normal; unnatural; unusual; irregular. (See Normal.)

Abscess. A circumscribed collection of pus in tissue.

Absorption. The taking in or sucking up by the absorbing vessels and tissues; imbibition.

Adhesion. Attraction between *unlike* molecules. (See Cohesion.)

Æmia. Refers to blood. (See Anæmia.)

Æther or Ether. An extremely subtle elastic substance which is supposed to pervade all space as well as all bodies. It may reasonably be assumed to be a simple form of gas, which, on account of its extreme tenuity is undetectable by any process at present known to science. It does not enter into combination with other substances; therefore, its quantity, quality, and action always remain constant. Assuming the atomic theory to be the correct one, æther forms the interstitial medium between the atoms and molecules of all gases, fluids, and solids; entering the inter-atomic and molecular spaces on the expansion of these bodies and receding on their contraction.

Ætiology. The science of causes; doctrine of the causation of disease.

Aggregate. To bring together; collect by drawing on to itself: to form a part or the whole.

Albumen. White of egg.

Albumin. Albuminous (nitrogenous) proximate principle, always containing in addition sulphur.

Albuminoid. The secreted and most active principle of liquids and solids of the living animal body, such as Casein, Ptyalin, Pepsin, Pancreatin, Mucosin, Myosin, Collagen, Chondrin, Elasticin, and Keratin. All are compounds of C.H.N.O. and S. (See Alkaloid.)

Albuminoid compound. A secreted fluid or solid of the animal body that contains an albuminoid, for instance, saliva, gastric juice, pancreatic juice, muscular fibres, cartilage, etc. (See Albuminoid.)

Albuminous. Relates to animal and vegetable food containing albumin mixed with other nutritious substances.

Albuminuria. Albumin in urine, such as Bright's disease.

Algæ. Bacteria associated with *chlorophyll* (this a vegetable alkaloid essential and necessary to plants).

Aliment. Nourishment; food.

Alimentary. Relating to aliment, or to the alimentary canal.

Alkaloid. The most active principle of certain plants, such as Quinine, Morphine, Strychnine, etc., all contain C.H.N. and O. (See Albuminoid.)

Alopecia. More or less complete loss of hair.

Alvine. Pertaining to the abdomen or intestines.

Alvus. Belly.

Amalgam. An alloy of mercury with another metal.

Anabolism. Constructive process; building up tissues from nutritive elements or substances; assimilation. (See Metabolism, and Katabolism.)

Anæmia. Insufficient number of or defective red blood-corpuscles in the blood, or a local or general want of blood in the body. (See Æmia.)

Analogus (analogous). Resembling; similar to.

Analysis. The act of dissolving any substance; separating constituent elements of a compound; to examine minutely or critically.

Anatomical. Everything that pertains to anatomy.

Anatomic element. The smallest natural division of the organism.

Anatomy. The art of dissecting organized bodies; the complete knowledge of the material human body.

Ancient. Of former times; of olden times.

Animalculum (*pl. Animalcula*). A minute organism.

Antagonism. Opposition; resistence; counteraction.

Anthrax. A contagious disease of malignant pustules or carbuncles accompanied by very high fever.

Anti. Against; opposed.

Antidote. A remedy which counteracts or removes the dangerous action of poison, or of disease.

Antipyric. A remedy which checks or prevents the formation of pus.

Antiseptic. A remedy that prevents or counteracts putrefaction.

Anti-toxine. An antidote. (See Antidote, and Toxine.)

Anuria. Suppression of urine.

Aphtha. Small white curd-like patches on mucous membrane in the mouth, on the tongue, and fauces, with small ulcers.

Appendage. An addition; an eye-brow, eye-lid, nails, hair, etc., are appendages.

Appendicitis. Inflammation of the appendix. (See Vermiform appendix.)

Appendix. An appendage. (See Vermiform appendix.)

Assimilation. The conversion of nutritious matter in the body into the proper organic tissues.

Atom. A primitive element; the smallest division of matter.

Atomic state. Matter reduced to atoms.

Auto. Self; origin within the body.

Auto-toxine. The active principle of decomposed poisonous matter developed within the body. (See Toxine, and Ptomaine.)

B

Bacillus (*pl. Bacilli.*)—from baculum, a stick or rod; a minute rod; rod-like bacterium; cylindrical microbes.

Bacteriologist. One who uses the microscope to examine or find microbes; one who cultivates microbes in a culture soil.

Bacteriology. The examination, cultivation, or finding of bacilli (microbes) with the aid of a microscope.

Bacterium (*pl. Bacteria*). A little rod. The word by which DeBary in his botanical work grouped the whole class of microbes, hence the name Bacteria. (See Schizomycetes.)

Beggiatoa. Genus of schizomycetes possessing cocci, rods, or threads.

Bouchard. A noted French physician.

C

C. Symbol for carbon; a carbon element. Also for Centigrade degree of temperature.

Cadaver. A carcass, or dead animal body.

Capillary. A hair-like blood or lymph vessel.

Carbon. A chemical element.

Cardiac. Relating to the heart.

Casein. An albuminoid compound of C.H.N.O. and S., the principal nutritive substance in milk.

CC. Cubic centimetre.

Cell. A nucleated mass of protoplasm, in the form of a small vessicle, composed of a jelly-like or somewhat fatty substance.

Cell pathology. The theory that the essential development and repair of the body is accomplished by cells, and the treatment according to it.

Cellular. Pertaining to or consisting of cells.

Centigrade. A scale to measure temperature, based on the decimal system.

Centimetre. One-hundredth of a metre; 0.3937 inch.

Centre. An aggregation of gray nervous cell-matter. (See Nervous Centre.)

Cerebro-spinal. Pertaining to the brain and spinal cord.

Cerebrum. The upper and largest part of the brain.

Cervical. Pertaining to the neck between the head and chest; the seven uppermost bones (vertebræ) of the spine.

Cervical region. Pertaining to or neighboring the cervical part of the spine.

Chemical. Of or pertaining to chemistry.

Chemical change. A change that alters the identity of a molecule. (See Physical Change.)

Chemism. Chemical affinity or attraction, especially considered as a manifestation of energy

Chemistry. The science of substantial changes.

Chlorophyll. A dark-green and essential alkaloid to vegetation composed of C.H.N. and O., imparting the green color to foliage and transforming the plant-food into vegetable life material or tissues.

Chole. Bile.

Choledochus. The hepatic or large bile duct which receives the bile from the smaller bile-ducts and discharges the bile into the duodenum (upper portion) of the small intestine.

Chondrin. The essential constituent of cartilage, an albuminoid consisting of C.H.N.O. and S.

Chondrus. Cartilage.

Cladothrix. Genus of schizomycetes, develops cocci, rods, threads, or spirals.

Clostridium. Bacillus. (See Bacillus, and Schizomycetes.)

Cocci. Short rodlets bacteria; long rodlets bacilli.

Coccus (*pl. Cocci*). (See Cocci, and Schizomycetes.)

Cogitate. To think; to meditate.

Cohesion. Molecular attraction between *like* molecules. (See Adhesion.)

Collagen. The essential organic basis of connective tissue, an albuminoid consisting of C.H.N.O. and S.

Coma bacillus. A microbe having the form of a coma of the smallest type-print, discovered by Koch in Asiatic cholera. Found by Denecke in old cheese; by Finckler and Prior in other matter.

Component. Helping to form; forming a part or ingredient; constituent; a constituent element or part.

Compound. Composed of or produced by the union of two or more elements, ingredients, or parts; a molecule; a mass of matter.

Compound of elements. A molecule. (See Compound.)

Conjunctivitis. An inflammation of the mucous membrane lining the inner surface of the eyelids and external eyeball.

Consciousness (*psychologically considered*). That power of the *rational soul* of returning *completely upon itself*, by which the intellect not only perceives the acts of the other faculties, but its own acts also, and recognizes itself as the subject of them.

Consonant. Consistent; in union or harmony.

Contagious. Capable of being caught; a disease capable of being communicated from one person to another; transmissible by contact.

Contaminated. Polluted; corrupt; tainted.

Culture soil. Some substance such as meat broth, gelatin, etc., in which microbes are placed for cultivation.

Cutaneous. Pertaining to the skin.

Cuticle (*epidermis*). The outer skin; scarf-skin.

Cycle. A circle; recurring; repeating itself.

D

Decay. Corruption of material substances; decomposed organic matter.

Decomposed. Broken up organic matter into parts; putrified; decayed organic matter.

Dementia. Loss of reasoning power; incoherency of ideas; last stage of insanity

Desquamation. A scaling from the skin; peeling or scaling off.

Diagnosis. The act of recognizing a disease by its symptoms, or, to distinguish one disease from another.

Digest. Analytical abridgment; methodical arrangement.

Doctrine. A particular view of a subject; that which is taught or set forth for acceptance or belief.

Dorsal. Relating to the back; second division of the spine, or upper half of the spine to which the ribs are attached.

Dorsal region. On or near the dorsal part of the spine.

E

Economy. An entire system of a vital organism; the entirety of an organic system; an entire animal body.

Elasticin. The homogeneous material of tissues, an albuminoid composed of C.H.N.O. and S.

Element. An atom; the smallest division of matter; for instance, oxygen, hydrogen, carbon, nitrogen, etc.

Elementary. Relating to the elements; primary; uncompounded

Embolism. The result of an embolus; obstruction of a blood-vessel by an embolus.

Embolus. A concretion formed in one place and transported by the blood to another locality; running to or that which is carried to or thrust in, as a piston or wedge.

Endo. In; within; interior.

Endothelium. The thin layers of cells lining all the internal *closed* cavities, such as the pleural cavity, the pericardium, the chambers in the heart, the membranes of cavities of the brain, the central canal of the spinal cord, the interior of blood vessels, lymphatics, the serous and synovial cavities, and the membranous labyrinth of the internal ear.

Energy. The power of producing positive effects.

Entozoa. Animal organisms living within other animal bodies from whose tissues they derive nourishment; for instance, worms in the intestines, or trichinæ spiralis in the muscles.

Epi. Upon, or above.

Epithelium. The thin layers of cells covering the entire skin of the body and the internal passages, such as the alimentary canal, the air passages, and such organs as the liver, kidneys, lips, etc.

Ether. (See Æther.)

Etiology. (See Ætiology.)

Exanthemata. An infectious, febrile, eruptive disease.

F

F. Symbol for Fahrenheit degree of temperature.

Fæces. Alimentary excrementitious matter.

Febrile. Of or pertaining to fever; caused or accompanied by or indicating fever.

Fever. A disease accompanied by 101° F., or higher temperature of the body. (The normal temperature of the body is 98.5° F., or 37.25° C.)

Fibre. Thin; thread-like.

Fibrillæ. Minute fibres.

Fibro. Prefix to words referring to fibrous tissue, either by composition, derivation, or resemblance.

Filament. A minute thread or fibre.

Flux. Flowing; looseness; an almost constant flowing.

Follicle (*Lat. Follis*). A small bag; a small tubular secreting sac.

Function. The action of an organ or set of organs; the work accomplished by a cell, organ, or organism.

G

Ganglion (*pl. Ganglia*). Small lumps or masses of special organs in the body, appearing under three forms: Those of the nervous system are always connected with nerve-fibres; the lymphatic glands with the lymphatic vessels; other ganglia, such as the thymus and thyroid glands and the suprarenal capsules.

Gastric. Relating to the stomach.

Gastro-intestinal. Relating to the stomach and intestines.

Germ. A minute organic mass, capable of developing into a cell, organ, or organism.

Gland. An organ composed of cells, blood-vessels, nerves, and absorbents, with the function either to secrete fluid for use in the economy or to excrete as waste.

Glandula (*pl. Glandulæ*). A small gland.

Grape-louse. Phylloxera. (See phylloxera.)

Glycocholin. A principal essential albuminoid of bile, an albuminoid composed of C.H.N.O. and S.

Glycosuria. Sugar in urine.

H

H. Symbol for hydrogen; hydrogen element.

Hæma. As a prefix indicates blood.

Hæmo. As a prefix indicates blood.

Hæmoglobin. A crystallizable hæmatin and globulin substance, originating in and coloring the red blood-corpuscles.

Histology. The science of minute anatomy; the science of minute constituents of organs and tissues.

Hydrogen. The lightest gas known—about 14½ times lighter than the atmosphere; in combination with oxygen it forms water; hydrogen is an element of all organic bodies.

Hydrophobia. An acute fatal disease resulting from the morbid poison of the saliva of a rabid animal, generally received from a bite.

Hypo. Under; beneath; below.

Hypogastric. Below the stomach; abdomen.

I

Immune. Exempt or protected against disease.

Immunity. Freedom or exempted from disease.

Infectious. Matter of a disease that can be communicated to another person; capable of infecting; any matter capable of causing disease in many persons at the same time.

Inflammation. Heat, redness, swelling, and pain in a part of the body.

Influenza. A special epidemic catarrhal fever, with inflammation of the gastric œsophageal and bronchial mucous and olfactory membranes, with nervous pains and prostration.

Infusoria. Water animalcula; found during summer in water exposed to moderately warm atmosphere, though the water be clarified, distilled, or boiled.

Inherent. Inborn; natural with; existing in, but not separable from it; permanently united as a natural original quality.

Inorganic. Without organs; that which is not, never was, and never can become an organism.

Instinct. An inherent impulse impelling the animal to act in a restricted specific manner. (See Inherent, and Intellect, and Reason.)

Intellect. A faculty of the human soul. (See Instinct, and Reason, and Judgment.)

Inter-atomic. Situated, existing, or acting between atoms.

Intercellular. Situated between or among cells.

Intermittent. Ceasing at intervals.

Intermolecular. Situated, existing, or acting between the molecules.

Interstitial. Between tissues; pertaining to connective tissue.

Itch. Scabies; an itching skin disease.

Itch-mite (*Lat. Acarus scabici*). A very small insect causing the itch.

Itis. Any word or term of disease ending with "itis" refers to inflammation.

J

Judgment. An act of the mind or soul by which it affirms the agreement or disagreement of two concepts or ideas. (See Intellect, and Instinct, and Reason.)

Jugular. Pertaining to the throat, or jugular vein.

Jugum. A yoke.

K

Katabolism. Destructive process; tearing down of tissues; degeneration. (See Anabolism, and Metabolism.)

Keratin. The resisting and indestructible substance of the hair, nails, epidermic scales, feathers, and all horny tissues; an albuminoid composed of C.H.N.O. and S.

Kinetic. Effecting or involving motion.

Kinetic energy. Energy which is essential to or possessed by a body or substance. (See Potential energy.)

L

Labyrinth. A structure of intricate winding passages; the vestibule cochlea and semi-circular canals of the internal ear is a labyrinth.

Latent. Present but not visible or apparent.

Latent energy. An energy that exists in molecules, compounds, or matter, but not visible or apparent.

Lepra or Leprosy. A chronic skin disease characterized by ulcerous eruptions and successive desquamations of dead skin.

Leptothrix. Filamentous cocci microbes.

Lesion. Injury; derangement; morbid change in structure or function of an organ or tissue.

Lethalis. Mortal; deadly; deep stupor.

Leucocytes. Colorless small cell-like spherical and nucleated corpuscles of protoplasm, having the power of amœboid movements, floating in lymph and blood derived from the lymph-glands of the mesentery.

Leucocythamplio. Increased number of leucocytes, accompanied by an abnormally decreased number of red blood-corpuscles.

Leucomaines. Poisonous animal alkaloids developed in the living body by metabolic processes; constituents analogous to ptomaines.

Leucorrhœa. White discharge, especially from the female genitals.

Life. Vitality; that state enabling metabolism within itself; being living.

Lister. A noted surgeon of England.

Living matter. The matter of living beings.

Living organism. An organism containing a vital principle (soul).

Lockjaw. A spasmodic stiffness of the muscles of the neck and cheeks, with pain on motion and closure of the lower jaw. (See Tetanus, and Trismis.)

Loeffler. A noted bacteriologist in Germany.

Lumbar. Pertaining to the loins.

Lumbar region. Sides of the abdomen and spine.

Lumbar spine. The third division of the spine, *i. e.*, the five vertebræ below the last dorsal vertebræ.

Lunatic. An insane person with lucid intervals.

Lupus (*L*). Wolf; skin wolf; a chronic localized infiltration and ulceration of the skin and subjacent tissues, generally about the nose, eating into the substance and leaving a deep, unpleasant scar.

Lymph. The fluid within the lymphatic vessels.

Lymphatics. Pertaining to lymph, lymph vessels, or lymph glands.

M

M. Metre.

MM. Millimetre; also micrometre.

MMM. Micromillimetre.

Malaria. A condition of disease produced by auto-toxine and caused by catching cold repeatedly on sultry-foggy nights in low swampy places, where the excessive high heat in the daytime makes the air full of dust and oppressive, the water foul and stagnated, and where the heat interferes with the function of proper digestion of the food. (See Auto-toxine.)

Malignant. Dangerous to life.

Mania. Insane excitement; hallucination and delirium.

Mass. Any quantity of matter that is composed of molecules.

Material. Consisting of matter; more or less necessary; the substance of which anything is made.

Matter. Anything that occupies space or takes up room, or that can exert or be acted on by force. Matter may exist in masses, molecules, or atoms, in either solid, liquid, or gaseous form; the subject of discourse.

Maxwell. A noted English physicist.

Medical World. A very desirable and useful monthly medical publication at Philadelphia.

Medium (*pl. Media*). That through which a body moves to any point; the means or instrument by which an agent acts or is acted upon; intervening or surrounding substance; anything that acts or serves intermediary.

Meningitis. Inflammation of meninges (membranes) of the spinal cord, or brain.

Metabolism. Process of change, alteration, metamorphosis. It includes anabolism and katabolism. (See Anabolism, and katabolism.)

Metamorphosis. Change of form, shape, function; transformation.

Metaphysics. The science of things above and beyond physics; generally employed as synonymous with mental philosophy.

Metre. A French measure, being 39.371 inches.

Microbe. The minutest vital thing possible and capable of entering all animal and vegetable decay matter wherever existing.

Microbe killer. A remedy supposed to kill microbes.

Microbe pathology. The doctrine that microbes produce disease, and the use of remedies supposed to kill the microbes of diseases.

Micrococci. Globular microbes; globular bacteria. (See Schizomycetes.)

Micrometer. A scale for minute measurement under the microscope.

Micromillimetre. The millionth part (0.000001) of a millimetre.

Micron. The one-thousandth part (0.001) of a millimetre.

Micro-organism. A very minute organism.

Microphytes. Minute microbes of plants.

Microscope. A magnifying or enlarging glass.

Micturition. The discharge of urine from the bladder.

Millimetre. The one-thousanth part (0.001) of a metre.

Mite. A very small insect. (See Itch-mite.)

Molecular. Relating to molecules; minute compound of atoms.

Molecule. A small compound of atoms or elements; the smallest compound of matter that can exist by itself; the physical unit of matter.

Molusca. A division of invertebrates, such as cuttlefishes, snails, bivalves, worms, etc.

Mollusk. One of the molusca.

Monomania. Insanity confined to a single idea or subject.

Morbid. A diseased or abnormal state; unhealthy; sickly.

Morphology. The science of the forms and elementary constituents of tissues, organs, and organisms.

Morsus. (*Lat. Mordeo*). A bite; grasp; sting.

Mortification. Loss of vitality; death of a part of an animal body while the rest is alive. When the part of a soft tissue mortified is recoverable it is called *gangrene;* if totally destroyed or dead it is called *sphacelus.* Mortification of bone when recoverable is called *caries;* when totally destroyed *necrosis.*

Mortified. Dead organic tissue.

Mucosin. A viscid thick glutinous constituent of mucus; an albuminoid composed of C.H.N.O. and S.

Mucous (*Lat. Mucosus*). Of the nature of mucus; relating to mucous membrane.

Mucus. A slimy secretion of the mucous membrane.

Muscular fibre. A cylindrical mass covered by a sheath termed *sarcolemma,* in length from one-fourth to one-half of an inch, and from 1-500th to 1-250th of an inch in diameter.

Mutual. Acting harmoniously together.

Myosin. The contractile substance of muscular fibres; an albuminoid composed of C.H.N.O. and S.

N

N. Symbol for nitrogen.

Naptha. A light colorless volatile inflammable oil distilled from petroleum.

Necrosis. Death of bone. (See mortification.)

Nerve. A bundle or string of nerve-fibres.

Nerve-fibre. A thin thread covered externally by a delicate sheath, underneath having a medullary (fatty, oily) layer, and in the middle the axis-cylinder. Many nerve-fibres in a bundle or string make a nerve.

Nerve-fibrillæ. The minutest nerve-fibres within and between nervous centres. Many fibrillæ together appear like marrow.

Nervous. Relating to the nervous system, nervous centres, their stimulation, action, excitation, and disturbances.

Nervous centre. In the nervous system every collection of gray matter is termed a nervous centre. (See Reflex, and Reflex-centre.)

Nitrogen. A colorless, tasteless, inodorous element; incombustible gas, 78 parts of which, with 22 parts of oxygen, constitutes atmospheric air.

Normal. Regular and natural action or structure. (See Abnormal.)

Nucleolus (*pl. Nucleoli*). The small nucleus within the nucleus of a cell.

Nucleus (*pl. Nuclei*). A central differentiated part of the cell; a nut, or kernel within a nut.

O

O. Symbol for oxygen.

Organ. A part of an organism.

Organic. Pertaining to or derived from an organism; matter that once was a part of or belonged to an organism. All animals and plants are organisms.

Organic chemistry. The chemistry of the carbon compounds. As many of these compounds exist already formed in the bodies of animals and plants, hence the name of organic chemistry.

Organic life. Life of animal or plant.

Organic matter. That what is or was a material part of an organism.

Organism. A combination of organs of an animal or plant.
Oscillation. Vibration.
Osseous. Bony; relating to or resembling bone.
Ossification. Formation of bone.
Oxidation. Conversion into an oxide, as of metals or other substances.
Oxygen. A tasteless, colorless (element) inodorous gas, 22 parts of which, with 78 parts of nitrogen, constitutes atmospheric air. One part by volume of oxygen, with two parts of hydrogen, constitutes water.
Ozæna. An ulceration in the nasal cavities with fetid discharge.

P

Pabulum. Aliment; food. The term pabulum may properly be limited to the food of cells, *i. e.*, the nutritious substances which enter the organism and become gradually more and more changed, and which, on arriving at the cells, is converted into protoplasm.
Pancreatin. The albuminoid or most active principle of pancreatic juice.
Pathogenytes. Minute vital beings present in organic matter. (See Schizomycetes.
Pathology. The doctrine of disease, its nature, and results.
Pepsin. The albuminoid or most active principle of gastric juice.
Pericardium. A double membranous sack enclosing the heart.
Periosteum. Fibro-vascular membrane surrounding or lining the bones.
Peripheral. Pertaining to the outer surface.
Pervade. To pass or pread through every part.
Phenomenon (*pl. phenomena*). Any action, motion, change, or occurrence of any kind; any change perceivable by the senses that occurs in an organ or vital function; a symptom.
Phthisis. Tuberculosis; consumption; any pathological process causing continuous change and destruction of the lung or other tissues.
Phylloxera. A minute plant-louse which is very destructive to grapevines. Some attack the roots and some the leaves and suck the sap of the plant, which causes swelling of the root and leaves and death of the plant.
Physical. Relating to the physical sciences or natural philosophy; of or pertaining to the material universe and its phenomena.
Physical change. A change not altering the identity of the molecule. (See Chemical change.)
Physical property. Relates to or belongs to a thing as an essential ingredient or power.
Physics. Natural philosophy; the science of nature, its objects and laws.
Physiological. Pertaining to or of the nature of physiology.
Physiology. The science of the laws of life and functions of living organisms.
Plague. The black death; the glandular pestilence; an intensely malignant disease, attended by high fever and burning buboes (glands) or carbuncles of the glands of the groin and armpits and glands of other parts of of the body.
Pleura. The closed serous sac lining the internal surface of the thorax divided by a septum (the mediastinum), each sac surrounding a lung.
Potential energy. Dormant energy, requiring favorable conditions for its manifestations; accidental energy. (See Kinetic energy.)
Principle. The chief part; fundamental substance.

Pro (*prefix*). Before; fore; forward; indicating beforehand.

Prognosis. The knowledge beforehand of the course and termination of a disease.

Promulgate. To make known to many; a doctrine made known of general interest: to make known by open declaration.

Propagate. To spread; to multiply; to perpetuate.

Prophylactic. To prevent; preventive.

Proteid. Holding the first place; principal acting constituent in a substance.

Protoplasm. Cell matter.

Psychology (a branch of Metaphysics). The science of the powers and functions of the human soul; doctrine of the human soul or mind.

Ptomaine. The principal acting substance in decayed or putrefied animal or vegetable tissue or matter. The ptomaine is to dead tissue or matter what the albuminoid (proteid) is to the living.

Ptyalin. The principal active agent in saliva (albuminoid).

Puerperal. Relating to childbirth or a consequence thereof.

Pulmonary. Relating to the lungs.

Pustule. A small pimple containing pus; a small circumscribed elevation of the cuticle with an inflamed base containing pus.

Putrefaction. Decomposed or decomposing organic matter; process of decaying or rotting.

Pyæmia. Fever due to pus absorbed into the blood.

Q

Quasi. As; having the resemblance of something; not fully genuine.

Quinia or quinine. An extracted alkaloid (compound of C.H.N. and O.) from cinchona bark.

R

Reason. An act of the mind by which is determined the agreement or disagreement, the identity or diversity, of two things, by comparing them with a third. (See Intellect, and instinct, and Judgment.)

Reflex. Refers to the action of an organ (muscle, respiratory, circulatory, or secretory organ) receiving its primary impression from stimulus directly or indirectly through impulses from another organ.

Reflex centre. Every nervous centre is a reflex centre. (See Nervous centre, and Reflex, and Spasm.)

Region (*Lat. Regio*). (Physiologically.) The tract or place neighboring; in extent; in area.

Reminiscence. Recollection; remembering; a faculty connected only with the higher faculties of man, his judgment and understanding; a faculty belonging exclusively to man because it is purely intellectual, while memory simple is common to all animals.

S

S. Symbol for sulphur.

Sanguis (*L.*). Blood.

Sanitary. Relating to the preservation of health, especially to hygiene and public health.

Saprophytes. Minute organisms which can only grow in dead or decaying matter; schizomycetes.

Scabies. The Itch-disease.

Schizomycetes. This term includes all Bacteria, Bacilli, Microbes, and allied forms.

Schizophyta. This term includes all of schizomycetes and Algæ.

Science. A systematic species of knowledge which consists of rules and order so as to arrive at truth.

Sensation. Vital organic representation.

Sense. The capacity or power of the animal for a particular species of what are termed *sensations*.

Sense-organs. The special portions (organs) of the organism endowed with the simple power of reacting to appropriate stimuli so as to produce sensations.

Sepsis. Infection of putrefactive poison.

Septicæmia. Disease aggravated by absorption of pus or putrid matter.

Serous. Pertaining to serum, or to serous membrane.

Serum. Watery portion of animal fluids.

Shock. A violent shake; concussion. Shock may affect the body or the mind, or both, while concussion affects only the body.

Spasm. Sudden, irregular, and involuntary contractions of muscles, due to reflex action of the spasm-centre in the medulla oblongata above the ala cinerea, or from reflex-centres at the upper part of the spinal cord. (See Reflex, and Reflex-centre, and nervous-centre.)

Specific. Definite, particular, or determinate.

Sphacelus. Gangrene of soft tissue, with complete death of the part. (See Mortification.)

Spinous. Relating to the spine; having the shape of a spine or thorn.

Spirillum (*Lat. Spira, pl. Spirilla*). Spiral form cocci. (See Schizomycetes.)

Spirochæta. A genus of Spirobacteria (schizomycetes), with spiral flexible filaments with movements apparently rotary.

Spiromonas. (Same as *Spirochæta.*)

Spontaneous. Occurring without assistance or without direct apparent cause.

Staphylo (*Gr.*). Bunch of grapes.

Staphylococcus (*pl. Staphylococci*). Micrococci occurring in irregular masses or heaps.

Staphylococcus pyogenes albus. Microbes of white color.

Staphylococcus pyogenes citrius. Microbes of yellow color.

Sterilized. Having destroyed all life of germs in a fluid, substance, or matter, either by heat, cold, or chemical action.

Stimulus. That which excites or arouses energetic action in an organism.

Strychnia or strychnine. A crystallizable, odorless, intensely bitter alkaloid (C.H.N.O.) prepared from nux vomica or ignatia.

Subtile. Penetrating; attenuated; ethereal; refined; piercing.

Suppuration. The production or formation of pus.

Symbol. That which stands for a thing.

Synovial. The fluid secreted by a synovial membrane.

T

Taurin. A colorless, crystallizable substance in bile, united with cholalic acid.

Taurocholin. A principal essential albuminoid constituent (C.H.N.O and S. compound) of bile.

Tenuity. Thinness; subtility.

Tetanic bacillus. Bacilli in disease of Tetanus found by Lœffler, a noted bacteriologist in Germany.

Tetanic spasms. Rigidity in paroxysms of tonic convulsions of the muscles of the neck, body, and limbs.

Tetanus. Spasms with rigidity in paroxysms of tonic convulsions of the muscles of the neck, jaw, spine, body, and limbs. (See Lockjaw and Trismus.)

Theory. A systematic generalization eminently accounting for a series or group of phenomena; speculation; an individual view.

Thrombus. A blood-clot formed during life in a vessel or tissue.

Tint. Slight coloring, yet distinct from the principal or original color.

Tissue. One of the elementary fabrics of which an organ is composed; formed by cells and their products arranged in a definite manner; texture of parts, particularly of animal or vegetable matter.

Toxæmia. A poisoned condition of the blood.

Toxical. Pertaining to or having the nature of poison; poisonous; a *toxic* disease.

Toxine. The active principle of decomposed poisonous matter; a ptomaine.

Trauma. A wound.

Traumatic. Relating to a wound or injury.

Trichina (*pl. Trichinæ*). A minute, small, hair-like worm.

Trichina spiralis. The trichina found in muscles of animals, especially in swine.

Trismus. Lockjaw; tetanus limited to the neck and jaw muscles. (See Lockjaw, and Tetanus.)

Trophic. Relating to nutrition.

Tubercle. Small, rounded eminence.

Tumor. A circumscribed *abnormal* new formation of tissue.

Tyrotoxicon. Cheese poison; a ptomaine of cheese.

U

Ulcer. A solution of continuity of soft parts, with loss of substance and production of granulation-tissue and secretion of pus.

Understand. To have full and clear knowledge of; the intellectual operations of forming proper ideas of simple or complex things that are brought to our mind. (See Comprehend.)

Uræmia. An abnormal condition of the blood due to the presence of urea with other urinary matter that ought to have been excreted by the kidneys.

U. S. P. United States Phharmacopœia.

V

Vascular. Pertaining to or containing vessels.

Vein, vena, phlebs. Vessels conveying blood inward toward the heart.

Velocity. Rate of motion.

Venous. Relating to veins.

Vermicular. Of or pertaining to a worm; resembling a worm or its movement.

Vermiform. Worm-like; having the form of a worm. (See Appendix.)

Vermiform appendix. The worm-like projection or appendix at the end of the ileo cæcal valve of the small intestine. (See Appendicitis, and Appendix.)

Vesicle (*Lat. Vesicula*). A small bladder, generally containing fluid.
Vibriones. Wavy-rods cocci; curved and spiral thread cocci.
Vice versa. The order or relation of things being reversed.
Virus. A substance, the result of a morbid process, capable of producing disease when inoculated; the active agent in the production of any infectious disease; a ptomaine; a poison.
Vital. Relating to life.
Vital being. Any thing that contains a vital principle or soul.
Vital energy. The power residing in a living being.
Vital organism. An organism that contains a life principle or soul.
Vital principle. Soul.
Volition. The act of willing or choosing.

W

Woorara. Curare; a very destructive poison of Guiana, which contains strychnia; a South American arrow poison.

X

Xyloma. Woody tumor, found on plants.
Xylon. Cotton.
Xysis. Scraping, rasping.

Y

Yelk. Yolk.
Yellow elastic tissue. Certain connective tissue fibrillæ, in thickness up to about 11 MMM, anastomosing with each other, found especially in the inner coat of arteries and lining of air passages.
Yolk (*vitellus*). The yellow of the egg.

Z

Zyme. Ferment.
Zymogenic. Producing fermentation.
Zymosis. Fermentation.

Human Physiology

Analysis and Digest

for the use of

Medical Students and Practitioners

by

Prof. John P. Schmitz, M. D.

Second Edition

in

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The Sympathetic System. Ganglia; Nervous plexuses; Ganglia-plexuses; Medulated and non-medulated nerve-fibres; Distribution of the sympathetic nervous system; Gasserian ganglion; Otic ganglion; Ophthalmic ganglion; Spheno-palatine, Submaxillary and other ganglia; Deep and superficial cardiac plexus; Semilunar, Renal, Aortic, Epigastric (Solar), Spermatic, Hypogastric, and about fifty other nervous plexuses; etc.

CHAPTER XVIII.

The Senses. Sense-organs; Sensations; Sight; Hearing; Smell; Taste; Touch; Common sense; External sensation; Internal sensation; Vital organic representation; The soul present in every part of the body; Exterior sensation in the brain denied; Consciousness defined; Imagination faculty; Estimative faculty; Sensitive memory; Reminiscence; Three distinct elements required for sensation; Modus operandi in sensation; etc.

CHAPTER XIX.

The Cranial Nerves. Sensory, motor, and mixed nerves; Olfactory nerve; Olfactory bulb; Optic nerve; Oculomotorius nerve; Trochlearis (Patheticus) nerve; Trigeminus nerve; Gasserian ganglion; Ophthalmic nerve; Superior and inferior maxillary nerves; Abducens nerve; Facial nerve; Auditory nerve; Glosso-pharyngeal nerve; Pneumogastric nerve; Spinal accessory nerve; Hypoglossal nerve; etc.

CHAPTER XX.

The Eye and the Sense of Sight. Eyeball; Sclerotic coat, cornea, and choroid coat; Hyaloid membrane; Vitreous body or humor; Aqueous humor; Anterior and posterior eye chambers; Ciliary muscle; Ciliary and suspensory ligaments; Canal of Petit; Pupil; Iris; Pupil contracting and dilating centres; Nerves of the iris; crystaline lens; Ciliary processes; Retina, Rods, and Cones; Optic nerve; Movements of the eyeball; Nerves and arteries of the eyeball; Eyelids; Lachrymal and Meibomian glands; Accommodation of the eye; Vision far and near; Artificial lenses; Light, sight, and velocity of light; color-blindness; Emmetropic; Hypermetropic; Myopic eye; Diplopia, and Presbyopia; Hemeralopia, and snow-blindness; etc.

CHAPTER XXI.

The Ear and the Sense of Hearing. External ear; Membrana tympani; Middle ear (tympanum); Malleus and Incus bones; Stapes; Muscles of the middle ear; Eustachian tube; Internal ear; Vestibule, Otoliths and Otoconia; Semicircular canals; Vertigo; Equilibrium; Osseous cochlea; Modiolus; Scala vestibuli; Scala tympani; Scalia media; Organ of Corti; Membrana basilaris; Sound; Vibrations; Wave-length; Loudness and pitch of sound; Quality of sound; Resonance; Hearing; etc.

CHAPTER XXII.

The Voice and Speech. Vocal cords; Muscles of the vocal organs; Vocalization; Vocal resonance; Limits of the human voice; Limits of hearing musical sounds; Action of the vocal cords; change of voice; Articulation; Speech defined; Speech centre; Sensory and motor aphasia; Ataxic aphasia; Stammering, and stuttering; etc.

CHAPTER XXIII.

The Skin. Epidermis and cuticle; Color of different human skins; Sectional view of the skin; Dermis; Papillæ of the skin; Corium; Muscular fibres of the skin; Arrectores pilorum; tension of the skin; Subcutaneous tissue, Sudoriparous glands, and perspiration; Sebaceous glands; Functions of the skin; Appendages of the skin; Hair; Gray hair; Blood-vessels, nerves, and lymphatics of the skin; Hæmorrhage of the skin; Nails; etc.

CHAPTER XXIV.

The Kidneys. Cortical and medullary substance; Renal pyramids; Glomerules; Malpiphian bodies; Composition of urine; Urea; Uric acid; Bladder; Incontinence, and retention of urine; Wolffian bodies; Bright's disease; Suprarenal capsules; Addison's disease; etc.

CHAPTER XXV.

Muscles and Muscular Tissues. Striated muscular fibres; Perimysium externum and internum; Muscular fasciculi; Sarcolemma; Tendons; Unstriped muscular fibres; Striped muscular fibres; Irritability of muscular fibres; Elasticity and tonicity of muscles; Contractility of muscles; Muscular action; Metabolism; Anabolism and Katabolism; Involuntary muscles,

CHAPTER XXVI.

Reproduction. Fission; Gemmation, Fecundation; Uterus; Fallopian tubes; Vagina; Round ligaments; Broad ligaments; Uterine arteries; Uterine nerves; Uterine lymphatics; Ovaries; Ovulation; Corpus Luteum; Testicles and spermatozoa; Fecundation; Impregnation; Ova; Germinal membrane; Blastoderm; Ectoderm, Mesoderm, and Entoderm; Decidua; Chorion; Placenta; Extra-uterine pregnancy; Graviditas in substantia uteri; Twin pregnancies; Mamma; Nausea and vomiting during gregnancy; Moles and hydatids; Fœtal circulation; Menstruation; Entozoa and Infusoria; Life functions and life's termination; Plant reproductions; etc.

CHAPTER XXVII.

Miscellaneous. Connective and fibrous tissues; Cartilage, bone, and periosteum; Gangrene; New formations; Cancer; Tumors; Fatty degeneration; Dissolution of the body; Spontaneous generation; Ptomaines; Infectious and contagion; Ether defined; Still-born; Artificial respiration; etc.

PREFACE

TO THE SECOND EDITION OF THE FOREGOING PHYSIOLOGY.

N. B.—A careful perusal of this Preface is especially recommended to my readers.

The demand for a Second Edition of this text-dook on physiology within such a short time surely indicates that the book is much appreciated, especially when the Second Edition requires no additions, alterations, or corrections of the main text of the first edition.

It is gratifying to notice that the time for the study of medicine in medical colleges has been extended to four years, which is surely not too long for one who wishes to acquire something above mediocrity in this science. In one respect, however, it may not be amiss to allude here to a serious defect in some localities in not requiring a better qualification in the knowledge of the Laws of Life.

Students intending to become physicians have a right to demand a most thorough teaching of the laws that govern the human body.

Deception in this regard is bad; and when diplomas are awarded to those who have not a thorough knowledge of physiology, it endangers human life and perpetuates conditions in the profession that keep up the danger. It is the duty of all medical examining boards to refuse licenses to applicants who are found deficient in this regard.

This work carefully distinguishes physiology from histology. It is notorious that even in some first-class Colleges these two branches are not unfrequently confounded. What can be ex-expected from the student when the teacher himself does not know that Physiology is the science of the **Laws** of life and **Functions** of living organisms; Histology the science of minute anatomy? It is on account of confounding these matters in text-books that the mischief is worked. The student gets confused, and at last gets to hate and shun physiology, managing to cram a few dozen answers to questions in one or two years in order to get out of it. The fact is, as the author has always experienced, that, when physiology is truthfully and comprehensively laid before students, no branch of medical knowledge is so pleasing and fascinating. The student soon gets to feel internally that the true and thorough knowledge of the **Laws of Life** is the very **Foundation** of medical competency, diagnosis, and safety of treatment.

The conscientious student will ask himself: How shall I be able to make a sure, true diagnosis? How shall I be able to know what remedy to administer? How shall I be able to know the physiological actions of remedies? The books on *Materia Medica* and *Practice* tell me that the action is such and such, but not one tells me *how the remedies act.* How shall I be able to know whether what I observe in a patient is to be attributed to remedies or to the disease?

A common sense man says, give me a lawyer thoroughly versed in the law and I will trust my case to him. Can a lawyer ignorant of the law know when he does harm to his case? Certainly not. It is exactly the same with the physician. The practitioner, ignorant of the laws of human life, may be not inaptly compared to a blind bird: It **May** find the grain on the wayside, but the chances are against it.

The greatest responsibility falls on the medical college faculty or officers, who supply the chair of physiology with simply a book-worm. In fact, it seems very often as if any physician is thought competent to fill that chair as Professor, provided he is able to talk the hour away two or three times a week. Such a Professor cares little whether the student has fully understood him or not, or in fact whether he has understood him at all; for, if he did, he would not

allow students, as very often happens, to cram a few dozen questions and answers for what is termed "Examination," and then dispense with phvsiology for the balance of the college course.

It has often been publicly remarked that no two physicians agree in regard to treatment. Why is this? Because if all physicians were thoroughly educated in physiology they would know positively what is required, and there would be no difference of opinion in treatment. Then the treatment of human beings would be truly scientific, but it cannot be without that knowledge. Physiology is no longer guess work; it is as positive as any other science, and the physician who does not know the laws of life is either at fault himself or the blame falls back on his teacher. It is not due to the science.

The author for years has maintained that the time required for the study of physiology in the medical colleges is too short, and he has kept his students for the full term of college study of four years on physiology. That he was not alone in this idea it is agreeable to notice that the College Faculty of Physicians and Surgeons, **London,** have by resolution extended the time for the study of physiology of three years, so that hereafter students are required to continue this subject for the full term of five years.

Anyone who maintains that medical students can be excused from the study of physiology before the end of their college life, knows but little about it. If he comprehended them, he would know the importance of that study.

Does the Professor on physiology ever reflect on the following:— Am I fit for the position? Do I do my duty? Am I not neglectful? Do I see that every student under my care fully comprehends the subject? Will I not be partly responsible for the acts of a physician once in my care who does more harm than good to patients, or perhaps shortens their lives on account of not having received from me thorough teaching?

On no other chair in medical colleges does the responsibility so forcibly rest as on the chair of physiology; because a doctor once out of college can easily continue the study of other branches of medical knowledge, but not that of physiology. This latter has to be acquired in the college, because to fully comprehend the laws of life requires a thorough and practical professor to teach, to read, to explain, to illustrate a subject sometimes in many different ways, before every student fully comprehends it. Besides, the explanations and illustrations have to branch off more or less on a subject of another chair, or to several at a time, so as to make the point understood.

It may not be too much to assume that the author in his text-book on "Human Physiology, Analysis and Digest," 1894, is the first who ever laid down in a medical college text-book the true fact of the following physiological laws:

First—That the **Stimulus** for respiration and circulation are the carbonic acid elements of the venous blood to the heart and lungs.

Second—That the **Acid** for the gastric juice normally originates in the lower portion of the œsophagus.

Third—That **External Sensation** lies in the sense-organ.

Fourth—That the living body comprehends an **Immaterial Vital Principle** or **Soul.**

Fifth—That all brain and spinal-cord **Nerve-Centre Actions,** voluntary or involuntary on external organs, are due to **Reflex Actions** only.

Sixth—That the **Cause of the Capillary Circulation** in the animal body is peristaltic.

Seventh—That the defective mucous membrane is the **Primary Cause of Consumption.**

Eighth—That the physiological action of remedies will become an exact science as soon as physiology is truly comprehended, and not before.

J. P. Schmitz, M. D.

3321 Twenty-first street,
San Francisco,
California.

(See page 47)

Key

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This book will be found of great assistance to the Medical Student. It contains the Questions and gives the number of the pages for answers in the author's "Text-book on Human Physiology; Analysis and Digest." (See Page 43.)
